# Instructional Materials Evaluation Criteria – Geometry

**Title** _____ **ISBN#** _____

**Established Track Record? YES ☐ NO ☐**
If yes, please list research source(s):

**Meets National Mathematics Standards? YES ☐ NO ☐**

## Standard 1: Students will acquire number sense and perform operations with real numbers.

| Objectives | Indicators | Covered? Yes | Covered? No | Explanation of Coverage | Percentage of Coverage |
|---|---|---|---|---|---|
| *There were no new extensions of the number system or number operations introduced in Geometry.* | | | | | |

## Standard 2: Students will use algebraic and geometric ideas to understand trigonometry.

| Objectives | Indicators | Covered? Yes | Covered? No | Explanation of Coverage | Percentage of Coverage |
|---|---|---|---|---|---|
| **Objective 2.1: Use triangle relationships to solve problems.** | a. Solve problems using the properties of special right triangles, e.g., 30˚, 60˚, 90˚ or 45˚, 45˚, 90˚. | | | | |
| | b. Identify trigonometric relationships (sine, cosine, and tangent), using right triangles, and express these relationships using exact values and approximations | | | | |
| **Objective 2.2: Use trigonometric ratios (sine, cosine, and tangent) to represent and solve problems.** | a. Find the angle measure in degrees given the trigonometric ratio and find the trigonometric ratio given the angle measure in degrees using a calculator. | | | | |

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| | c. Find unknown measures of right triangles using sine, cosine, and tangent functions and their inverses. | | | | |

| **Standard 3: Students will solve problems using spatial and logical reasoning, applications of geometric principles, and modeling.** | | | | | |
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| **Objectives** | **Indicators** | **Covered? Yes** | **Covered ? No** | **Explanation of Coverage** | **Percentage of Coverage** |
| **Objective 3.1: Use inductive and deductive reasoning to develop mathematical arguments.** | a. Write conditional statements, converses, and inverses and determine the truth value of these statements. | | | | |
| | b. Formulate conjectures using inductive reasoning. | | | | |
| | c. Prove a statement false by using a counterexample. | | | | |
| **Objective 3.2: Analyze characteristics and properties of angles and angles formed by intersecting and parallel lines.** | a. Use accepted geometric notation for lines, segments, rays and angles. | | | | |
| | b. Identify relationships in angle pairs such as adjacent, complementary, a linear pair, supplementary, or vertical | | | | |
| | c. Classify angle pairs formed by two lines and a transversal, e.g., corresponding, alternate interior, and supplementary angles. | | | | |
| | d. Prove relationships in angle pairs. | | | | |
| | e. Prove lines parallel or perpendicular using slope or angle relationships. | | | | |

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| **Objective 3.3: Analyze characteristics and properties of triangles.** | a. Prove congruency and similarity of triangles. | | | | |
| | b. Use isosceles and equilateral triangles to develop properties of special right triangles. | | | | |
| | c. Prove the Pythagorean Theorem and its converse in multiple ways and use it to find missing sides of right triangles. | | | | |
| | d. Use triangle properties to develop and justify relationships for sides and angles. | | | | |
| | e. Identify medians, altitudes, and angle bisectors of a triangle, and the perpendicular bisectors of the sides of a triangle. | | | | |
| **Objective 3.4: Analyze characteristics and properties of polygons.** | a. Use examples and non-examples to classify subsets of quadrilaterals. | | | | |
| | b. Prove properties of quadrilaterals using triangle congruence relationships. | | | | |
| | c. Develop formulas for quantitative features of polygons and justify how they were derived. | | | | |
| **Objective 3.5: Analyze characteristics and properties of circles.** | a. Identify radii, diameters, chords, secants, arcs, sectors, central angles, inscribed angles, and tangents of circles and solve problems using their properties. | | | | |
| | b. Develop the relationships between the measures of intercepted arcs and inscribed or central angles. | | | | |

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| **Objective 3.6: Analyze characteristics and properties of solid figures.** | a. Classify polyhedra and other three-dimensional figures by their distinguishing characteristics. | | | | |
| | b. Identify three-dimensional objects from different perspectives using nets, cross-sections, and two-dimensional views. | | | | |
| | c. Develop surface area and volume formulas for polyhedra, spheres, cones, and cylinders. | | | | |
| **Objective 3.7: Use visualization, spatial reasoning, and geometric modeling to solve problems.** | a. Solve real-world problems using geometric properties. | | | | |
| | b. Use the Pythagorean Theorem to solve real-world problems | | | | |
| | c. Solve problems using the distance formula | | | | |
| | d. Solve problems involving trigonometric ratios | | | | |
| **Objective 3.8: Specify locations and describe spatial relationships using coordinate geometry.** | a. Verify the classifications of geometric figures using coordinate geometry to find lengths and slopes. | | | | |
| | b. Find the distance between two given points and find the coordinates of the midpoint. | | | | |
| | c. Write an equation of a line perpendicular or parallel to a line through a given point. | | | | |

| **Standard 4: Students will understand and apply measurement tools, formulas, and techniques.** | | | | | |
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| **Objectives** | **Indicators** | **Covered? Yes** | **Covered ? No** | **Explanation of Coverage** | **Percentage of Coverage** |
| **Objective 4.1: Use tools such as a protractor, compass,** | a. Construct/copy angles and segments. | | | | |

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| **straightedge, or technology to investigate geometric properties.** | b. Bisect angles and segments. | | | | |
| | c. Construct perpendicular and parallel lines. | | | | |
| **Objective 4.2: Use appropriate techniques, tools, and formulas to find lengths and areas of polygons and circles as well as lengths, surface areas, and volumes of three-dimensional shapes.** | a. Find linear and angle measures using appropriate tools or technology. | | | | |
| | b. Determine perimeter, area, surface area, lateral area, and volume for prisms, cylinders, pyramids, cones, and spheres given the formulas. | | | | |
| | c. Calculate or estimate the area of an irregular region. | | | | |
| | d. Find the length of an arc and the area of a sector given the angle measure and radius. | | | | |

| **Standard 5: Students will apply concepts and methods from probability and statistics to solve real problems.** | | | | | |
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| **Objectives** | **Indicators** | **Covered? Yes** | **Covered ? No** | **Explanation of Coverage** | **Percentage of Coverage** |
| **Objective 5.1: Apply basic concepts of probability and geometry to solve problems of geometric probability.** | a. Compute probabilities using simple geometric ideas, such as ratios of areas or lengths. | | | | |
| | b. Determine whether or not a geometry based game is fair. | | | | |

| **Curriculum Coverage** | **3** | **2** | **1** | **0** | **N/A** |
|---|---|---|---|---|---|
| Meets Core Standards and Objectives | 80% of the state core objectives are covered.<br><br>Objectives in instructional materials are clearly stated with measurable outcomes. | 70% of the state core objectives are covered.<br><br>Objectives in instructional materials are clearly stated with measurable outcomes. | 50% of the state core objectives are covered. | Less than half of the state core objectives are covered. | |
| Content | Accurate information reflecting current mathematical knowledge.<br><br>No content bias. | Some inaccuracies found, however information reflects current mathematical knowledge.<br><br>No content bias. | Many inaccuracies were found on major mathematical concepts or content bias created problems with mathematical concepts. | Major inaccuracies found in mathematical content or concepts. | |
| Covers Process Skills | Materials support and encourage students to use mathematical process skills (i.e., problem solving, communication, reasoning and proof, connections, representation). | Materials provide a range of activities with set outcomes.<br><br>Process skills are mentioned but not incorporated into instructional process. | Materials provide a set of explicit step-by-step instructions.<br><br>Limited amount of process skills mentioned. | No hands-on activities.<br><br>No process skills mentioned. | |
| Age Appropriate | A wide range of activities to accommodate various developmental levels at a reasonable pace and depth of coverage.<br><br>Includes age appropriate cross-curricular references (e.g., literature, software, etc.)<br><br>Content organized so prerequisite skills and knowledge are developed before more complex skills. | Some activities are adaptable to the appropriate age level.<br><br>Some cross-curricular activities are given.<br><br>Some attention given to prerequisite skills and knowledge. | Limited developmentally appropriate activities.<br><br>Prerequisite skills and prior knowledge are not sufficiently developed before more complex concepts are introduced. | Age appropriate issues are not addressed.<br><br>Several activities are not based on appropriate levels. | |
| Pedagogically Sound | Facilitates a wide range of teacher and student activities that reflect various learning styles and individual needs of students.<br><br>Includes a wide variety of pedagogical strategies for flexible grouping and instruction. | Encourages and assists teachers in addressing learning styles and individual needs of students.<br><br>Includes various pedagogical strategies for flexible grouping and instruction. | Addresses differences in learning and teaching to a limited degree.<br><br>Includes some pedagogical strategies for flexible grouping and instruction. | Hinders effective pedagogy. | |

| **Physical Qualities** | **3** | **2** | **1** | **0** | **N/A** |
|---|---|---|---|---|---|
| Durability | Materials are securely bound and reinforced. | Materials are hardbound adequately. | Materials have secure binding. | Materials have inferior binding. | |
| Print Size and legibility for intended grade level | Appropriate use of font size and format for intended grade level. | Font size adequate for intended grade level. | Font size and format too small or too large for age group. | Font size inconsistent. | |
| | Key words or phrases bold faced and/or italicized. | Some key words or phrases boldfaced and/or italicized. | Highlighting was used too much, emphasized too much information. | No key words or phrases boldfaced or italicized. | |
| Pictures, tables, and graphics | Appropriate and varied pictures, tables, and graphs.<br><br>Graphs and tables are correctly labeled (e.g., titles, keys, labels). | Limited pictures, tables, and graphs.<br><br>Some tables and graphs are not labeled correctly. | Very limited pictures, tables, and graphs. | Inappropriate pictures, tables, and graphs. | |
| Includes table of content, glossaries, and index | Tables of contents, indices, glossaries, content summaries, and assessment guides are designed to help teachers, parents/guardians, and students.<br><br>Clearly represents concepts within the text. | Tables of contents, indices, glossaries, content summaries, and assessment guides are designed to help teachers, parents/guardians, and students, are adequate but not clearly defined concepts within the text. | Simple tables of contents, indices, glossaries, content summaries, and assessment guides are included. | Is missing one or more of the following: simple table of contents, glossaries, content summaries, assessment guides, or indices. | |
| **Ancillary Materials** | **3** | **2** | **1** | **0** | **N/A** |
| Teacher Materials | Lesson plans are easy to understand and implement.<br><br>Are clearly written and presented with accurate concepts. | Most lesson plans are easy to understand and implement.<br><br>Are clearly written and presented with accurate concepts. | Lesson plans are difficult to understand. | No lesson plans. | |
| | Mathematical terms and academic vocabulary are appropriately used. | Generally mathematical terms and academic vocabulary are appropriately used. | Some mathematical terms and academic vocabulary are appropriately used. | There is a lack of mathematical terms and academic vocabulary. | |
| | Incorporates integration suggestions to other curriculum areas. | Most integration supports other curricular areas. | Some integration support for other curricular areas. | No integration support available. | |
| | Investigations and problem solving activities focus on demonstrating mathematical principles in the content area. | Most investigations and problem solving activities focus on demonstrating mathematical principles in the content area. | Limited investigations and problem solving activities focus on demonstrating mathematical principles in the content area. | Investigations and problem solving activities are not related to content area or no investigation activities. | |

| **Ancillary Materials cont.** | **3** | **2** | **1** | **0** | **N/A** |
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| Student Materials | Activities engage students in purposeful mathematics. | Most activities engage students in purposeful mathematics. | Some activities engage students in purposeful mathematics. | Activities do not develop the concept studied. | |
| | Activities incorporate use of process skills (i.e., problem solving, communication, reasoning and proof, connections, representation) for deep understanding of mathematical principles. | Activities encourage the use of process skills for deep understanding of mathematical principles. | Activities mention the use of process skills for deep understanding of mathematical principals. | Activities do not encourage process skills for deep understanding of mathematics. | |
| | Includes ideas to extend concepts in real world applications. | Some ideas are included to extend concepts in real world applications. | Limited real world applications. | No real world applications suggested. | |
| Parent Materials | Homework assignments and activities support classroom learning and are written so that parents/guardians can help their children. | Suggested strategies and activities to assist parents/guardians. | Limited activities available for parent/guardian use. | No parent/guardians activities included. | |
| | ESL strategies and activities that support classroom learning are provided in materials sent home to parents. | Some ESL strategies and activities are provided in materials sent home to parents. | A few ESL strategies and activities that may be sent home to parents are provided. | No ESL strategies and activities are provided. | |
| Manipulatives | Manipulatives are provided and are appropriate. | Manipulatives are provided. | Manipulatives are not provided. | Manipulatives are not part of the program. | |
| | Manipulatives can be replaced economically and locally. | Manipulatives can be replaced locally or by mail order. | Needed manipulatives can be obtained locally or special ordered. | | |
| **Technology (teachers)** | **3** | **2** | **1** | **0** | **N/A** |
| Ease of Use | Menus are easy to read and follow. | Menus are generally easy to read and follow. | Menus are easy to read. Might have to read manual to understand operation of technology. (e.g., laser remote, software.) | Menus are not very descriptive. Hard to follow. | |
| | User-friendly installation requires a minimal level of computer expertise. | Installation requires little computer expertise. | Installation requires some knowledge or expertise. | Installation requires expertise. | |
| | Manual and directions are understandable. | Manuals and directions are simple. | Manuals are included. | No manuals or written instructional materials are provided. | |

| **Technology (teachers) cont.** | **3** | **2** | **1** | **0** | **N/A** |
|---|---|---|---|---|---|
| Audio/Visual attributes | High quality audio and visuals are correct and contribute to overall effectiveness of program. | Audio and visuals are of good quality. Complements program effectiveness. | Audio and visuals are acceptable. Aligned with program content. | Audio and visual defects are apparent. Distracts from program content. | |
| | Information is current and up-to-date. | Information is current. | Information is mostly current. | Information is out-of-date. | |
| Enhances learning experience | Enhances learning experience. Adds depth and diversity. | Offers some additional depth and diversity to learning experience. | Mild impact to overall learning experience. | Does not impact learning experience. | |
| **Technology (students)** | **3** | **2** | **1** | **0** | **N/A** |
| Calculator | Appropriate activities and materials are provided to explore and prove conjectures. | Activities help students learn use to use calculator to explore concepts | Activities to learn to use calculators | No use of calculators or calculators used to check work only. | |
| Computer | Software allows students to explore and prove mathematical conjectures | Software allows students to explore math conjectures | Software demonstrates processes for mathematical applications | Drill and practice only | |
| **Universal Access** | **3** | **2** | **1** | **0** | **N/A** |
| Content accurately reflects diverse population | Provides ways to adapt curriculum for all students (e.g., special needs, learning difficulties, English language learners, advanced learners.) | Provides some ways to adapt curriculum to meet assessed special needs. | Provides limited strategies to assist special needs students. | Inappropriate strategies to assist special needs students. | |
| | Accurate portrayal of cultural, racial, and religious diversity in society. | Mostly accurate portrayal of cultural, racial, and religious diversity in society. | Does not address diversity in society. | Inaccurate portrayal of diverse populations and society. | |
| **Assessment** | **3** | **2** | **1** | **0** | **N/A** |
| Provides a variety of assessment options | Multiple measurements of individual student progress at regular intervals ensuring success of all students. | Assessment requires students to apply some concepts. | Assessment requires students to apply few concepts. | Provides only paper and pencil assessment. | |

| **Assessment cont.** | **3** | **2** | **1** | **0** | **N/A** |
|---|---|---|---|---|---|
| Assessment tools | Scoring tools and rubrics in assessment package. | Some scoring tools and rubrics provided. | Very few assessment tools are provided. | Answer keys to paper and pencil assessments. | |
| Assessment alignment to objectives | Assessment is provided to assess 80% of stated objectives with a variety of assessment strategies and items. | Assessment is provided to assess 70% of stated objectives. | Assessment is provided to assess 50% of stated objectives. | Assessment is provided to assess less than 50% of stated objectives. | |
| Assessment for understanding | Assessment requires the application of ideas and concepts. | Assessment requires the application of some ideas and concepts. | Assessment requires the application of few ideas and concepts. | No application of ideas and concepts. | |